SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING DECEMBER, 1925

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For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements the reader is referred to the REVIEW for January, 1924, **52**: 42, and January, 1925, **53**: 29.

From Table 1 it is seen that solar radiation intensities averaged slightly above December normals except at Madison, Wis., where few intensities were measured.

Table 2 shows that the total solar and sky radiation received on a horizontal surface averaged slightly above the December normal at Washington and slightly below the normal at the other two stations.

For the year Table 2 shows a slight deficiency in radiation at all three stations, which, however, at Washington and Madison is less than the deficiency for October at these stations, and at Lincoln exceeds the October deficiency but little.

Skylight polarization measurements made at Washington on five days give a mean of 64 per cent, with a maximum of 69 per cent on the 18th. These are above the corresponding December averages for Washington. At Madison no sky polarization measurements were made during the month, as the ground was covered with snow.

TABLE 1.—*Solar radiation intensities during December, 1925*

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	Sun's zenith distance: 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Dec. 7	2.03	0.89	0.99	1.16	1.38			1.17	1.03	0.91	2.49
8	3.00				1.29						3.00
10	2.26	0.87	1.00	1.15	1.43			1.11	0.92	0.77	1.78
12	4.17				1.11			0.97	0.93	0.80	3.81
14	2.16							0.71			2.62
18	2.74	0.65	0.79	0.94	1.25			1.09	0.92	0.77	2.26
23	1.68	0.78	0.94	1.12	1.27						1.37
28	0.96				1.25			1.08	0.93	0.80	1.32
29	1.32	0.79	0.86	0.95	1.16			1.01	0.89		1.32
31	1.60			0.83	1.17			0.98			1.78
Means		0.80	0.92	1.02	1.26			1.02	0.94	0.81	
Departures		+0.02	+0.03	−0.03	+0.04			+0.01	+0.04	+0.03	

Extrapolated.

TABLE 1.—*Solar radiation intensities during December, 1925*—Con.

[Gram-calories per minute per square centimeter of normal surface]

Madison, Wis.

Date	Sun's zenith distance: 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Dec. 9	3.00	0.95									2.87
10	1.78			1.13				1.19			1.96
14	1.88			1.09							2.49
18	0.96			1.09							1.37
19	3.30			1.02	1.20						3.63
26	0.51			1.19							0.48
Means		(0.95)		1.10	(1.20)			(1.19)			
Departures		−0.01		−0.11				−0.09			

Lincoln, Nebr.

Dec. 5	1.60	1.02	1.17	1.30							1.88
8	4.17							1.21	1.08	0.96	5.56
9	4.17			1.00				1.26	1.14	1.04	5.56
11	3.81	1.00	1.14	1.28	1.44			1.26	1.10	0.99	5.56
12	3.81							1.17	1.06	0.90	4.95
15	2.36							1.22	1.12	1.06	2.16
18	2.74	0.75	0.89	1.10				1.14	1.03	0.94	4.17
19	3.00	0.89	1.04	1.20							3.15
22	1.45	1.03	1.16	1.30	1.47			1.28	1.15	1.02	1.52
31	2.26	0.95	1.07	1.25				1.25	1.14	1.04	3.15
Means		0.94	1.08	1.20	(1.46)			1.22	1.10	0.99	
Departures		±0.00	+0.02	−0.03	+0.09			+0.01	+0.02	+0.03	

[1] Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface*

[Gram-calories per square centimeter of horizontal surface]

Week beginning—	Average daily radiation: Washington	Madison	Lincoln	Chicago	New York	Average daily departure from normal: Washington	Madison	Lincoln
1925	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Dec. 3	130	79	165	38	75	−16	−42	−11
10	163	117	164	47	124	+20	−6	−8
17	133	110	153	39	74	−10	−17	−21
24[1]	156	158	184	67	112	+10	+26	+6
Deficiency for the year						−959	−254	−2,310

[1] Eight-day period.